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RECEIVED 17 September 2025
ACCEPTED 02 October 2025
PUBLISHED 23 October 2025

CITATION
Boersma K, Clark N, Grace R, Ncube A and
Tagliacozzo S (2025) Editorial:
Cross-boundary disaster communication:
building systems thinking and breaking
traditional divisions in the field.
Front. Commun. 10:1707704.
doi: 10.3389/fcomm.2025.1707704

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Editorial: Cross-boundary disaster communication: building systems thinking and breaking traditional divisions in the field

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KEYWORDS

disaster risk reduction, disaster communication, disaster resilience, disaster risk management, multi-disciplinary, early warning, social media

Editorial on the Research Topic

[Cross-boundary disaster communication: building systems thinking and breaking traditional divisions in the field](#)

Our societies are facing risks that are increasingly complex, interconnected, and unpredictable. Globalization, technological interdependence, and climate change mean that hazards are no longer confined to a single location, sector, or phase of the disaster cycle. Systemic and cross-border threats disrupt the functioning of critical societal systems and essential businesses, ranging from healthcare and energy to transportation and information networks [United Nations Office for Disaster Risk Reduction (UNDRR), 2023; Jordan and Shaw, 2025; OECD, 2023]. These risks challenge the very foundations of resilience and governance (Clark et al., 2025; Tierney, 2022). Addressing them requires disaster communication scholarship to move beyond the traditional boundaries of place, discipline, and hazard type and to develop systemic solutions that can operate across scales, sectors, and contexts.

This shift calls for the design of innovative and integrative communication strategies that span organizational, disciplinary, cultural, and territorial divides (Balog-Way et al., 2020; Boersma et al., 2021; Comfort et al., 2019). It demands the creation, nurturing, and strengthening of partnerships among diverse actors, including government agencies, emergency services, the private sector, community organizations, and the media, through cross-actor and cross-organization dialogue (Palen et al., 2009; Tierney et al., 2006; Kapucu and Hu, 2020). It also requires robust theoretical frameworks and evidence-based practices that can be adapted to multiple contexts (e.g., urban and rural settings), hazard types (e.g., multi-hazard and cascading events), and temporal phases of the disaster cycle (e.g., preparedness and recovery).

The accelerating emergence of systemic and transboundary risks makes it urgent to explore new approaches to disaster (risk) communication and to integrate lessons from

different disciplines and societal sectors. Achieving this transformation is a complex undertaking. It requires sustained collaboration between researchers across disciplines who advance theoretical and methodological innovation and practitioners who translate these insights into actionable strategies in the field. Only by bringing these perspectives together can disaster communication evolve to meet the demands of an increasingly interconnected and risk-prone world.

This Research Topic builds on these challenges and opportunities by integrating insights from different disciplines and practical applications to overcome the boundaries of traditional disaster communication research. Recognizing that no single discipline can fully grasp or address the multifaceted nature of contemporary risks, this Research Topic brings together experts with diverse backgrounds and areas of expertise from a wide range of disciplinary fields, including communication studies, disaster risk reduction, public administration, and information sciences. Fostering interdisciplinary dialogue to bridge often siloed fields, the contributions advance conceptual understanding and offer actionable strategies for addressing systemic, cross-boundary threats to guide policy, practice, and future research in disaster communication.

The eight articles featured in this Research Topic address the cross-boundary focus from different perspectives; collectively, however, they highlight common priorities around trust, collaboration, accessibility, and gaps in data quality and use, which are crucial for advancing disaster communication research and practice.

In “*Can data cross frontiers? Challenges and drivers for cross-border data sharing for disaster risk reduction*,” Adrot et al. argued that, while adequate data sharing is critical for disaster risk reduction (DRR) and cross-border resilience, it remains a challenge for the majority of crisis management organizations. For their article, the authors examined the Italy–France border, where efforts to develop a cross-border DRR data ecosystem face many challenges. Based on qualitative interviews, observations, and archival analysis, they found that cross-border settings amplify challenges related to trust, coordination, and (the lack of) unified data strategies. Despite these difficulties, crisis management actors are gradually transforming practices through cooperative, inclusive, and trust-based relationships. This contribution highlights the importance of context-sensitive communication approaches, emphasizing the need to account for border-specific dynamics when building effective international DRR data-sharing ecosystems and crisis communication.

The next contribution, by Bean et al., titled “*Mobile public warning in Japan and the United States: a sister cities collaboration*,” explored how, over the past decade, cell broadcast systems have been adopted to deliver mobile public warnings for natural and human-caused disasters. Despite good practices in Japan and the U.S., these systems are often underused, misused, or misunderstood. This article presented the results of an analysis of official documents and transcripts from four Japan–U.S. meetings and workshops involving researchers, crisis management officials, and residents in Yamagata, Japan, and Boulder, USA. The findings highlight the need to balance local adaptation with global standardization in mobile public warning systems. This

contribution to the Research Topic offers cross-national insights to improve system effectiveness and communication, supporting crisis management officials in safeguarding communities amid intensifying climate-related and other hazards.

Indeed, the need to improve public warning systems is increasingly highlighted as a key priority in international research and policy agendas (e.g., the midterm review of the Sendai Framework). In their article “*Bridging gaps in research and practice for early warning systems: new datasets for public response*,” Pescaroli et al. explored the high potential for the use of Early Warning Systems (EWSs) for disaster and crisis response and communication across diverse hazards. While this potential is recognized by the majority of crisis management organizations, gaps remain in understanding the technical, social, and organizational factors that determine their effectiveness. Drawing on literature and global datasets, including the World Risk Poll, the authors highlighted four key areas for improving the design and use of EWSs: leveraging public responses, understanding trust in information sources, addressing limitations in current analyses, and overcoming operational challenges such as data accessibility and harmonization. Based on their analysis of the literature and current practices with regard to EWSs, they proposed a multi-country benchmarking approach to identify shared patterns, improve the management of complex and cross-border crises, and enhance the socio-technical integration of disaster risk knowledge in early warning operations.

Even at the national and local levels, public warning systems require more attention to ensure that guidance can be translated into effective action. In this context, the article “*What to do when the earth shakes? DCH or door-frames: evaluating generalised risk minimisation guidance*” by Ramkumar examined the effectiveness of Protective Action Measures (PAMs) for earthquake risk reduction, challenging the prevailing one-size-fits-all communication approach. Drawing on research in Nepal and Aotearoa/New Zealand, the author applied critical discourse analysis to explore how expert paradigms, narratives, and knowledge systems shape PAM development and dissemination. This article builds on fieldwork conducted by the author during the 2015 Gorkha earthquakes, which revealed widespread confusion, misapplication of guidance, and even heightened risk when generalized advice was followed. Ramkumar used Google Trends data to demonstrate the heavy reliance on outdated recommendations during disaster events. This contribution to the Research Topic calls for context-specific, critically evaluated PAMs to ensure that risk communication truly reduces vulnerability.

Innovative, cross-boundary disaster communication also means transcending traditional sources and channels for gathering and sharing risk and crisis data, especially in scenarios where data gaps persist. In their contribution “*Framing of disaster impact in online news media: a case study from Malawi on flood risk management*,” Bailon et al. argued that, although high-quality impact data should underpin adequate and proactive disaster risk management and communication, serious gaps persist in actual crisis management and communication practices, particularly in data-poor contexts. Local news media can potentially help bridge these gaps. Focusing on flood-prone Malawi, this article compared impact information from four leading national newspapers with

records from the international Emergency Events Database (EM-DAT), applying natural language processing (NLP) to analyze linguistic features and disaster framing. This contribution to the Research Topic shows that online news adopts a human-focused narrative and provides impact details that are indeed useful for quantifying damage. The findings highlight the potential of local media as a complementary data source, offering richer, context-specific insights to strengthen impact databases and support disaster risk management and communication.

Over the past decade, social media has emerged as a promising medium for risk and crisis communication and as a bridging mechanism between traditional DRM actors and the public. However, the full potential of social media use is still largely unrealized, owing to slow adoption processes, mistrust, and competency/knowledge gaps around its application by DRM organizations. The first article in this Research Topic to address this topic is “*Bridging the gap in flood risk communication: a comparative study of community and organizational social media posts using natural language processing.*” Salley et al. presented their research on flood risks in the U.S., which are rising due to climate change. They argued that, while these new risks require new ways of communication, flood risk communication often remains one-directional, limiting community preparedness. This article pleads for a stronger alignment between community and formal crisis management organizational messages. It presents the findings of a study on social media communication during the July–August 2022 flood events across nine states. Using Natural Language Processing, the authors analyzed message content, sentiment, and emotion to assess whether organizational communication reflects public needs and fosters two-way dialogue. The results reveal temporal and spatial patterns in messaging and highlight the gaps in the engagement of the crisis management organization with citizens. Based on these insights, the authors propose concrete recommendations to improve interactive flood communication, supporting more responsive, context-sensitive strategies for diverse populations and various disaster scenarios.

In a similar vein, the article “*Social listening and crowdsourcing in disaster communication—A citizen-centered media and communication consumption perspective*” by Andersen et al. argued that building resilient communities requires strong connections between disaster management organizations and citizens, with communication and engagement as key tools. The authors explored the potential of crowdsourcing and active social listening in a Danish urban setting through expert interviews, citizen focus groups and surveys, and a media ethnographic study of local social media interactions. The findings presented in this contribution reveal that while some organizations already apply these principles, local context and media consumption habits present challenges. Platforms preferred by the citizens often limit digital crowdsourcing and communication to occur across multiple networks. The contribution highlights the need for specific strategies, both digital and non-digital, to enhance engagement and strengthen citizen–organization relationships in disaster management and communication.

Finally, the last article, “*Enhancing Two-way Communication in Disaster Management in the EU -practical insights*” by Vollmer et al., challenged current practices in risk communication and

proposed solutions for two-way communication approaches in disaster risk management. As natural and complex disasters increase, effective two-way risk communication between civil protection agencies and citizens is vital. The authors showed how social media enables rapid information exchange but also spreads misinformation. The article builds on the research outcomes of two EU Horizon 2020-funded projects that addressed this challenge. From the PANDEM-2 project, the authors distilled how agencies, the media, and experts operationalize two-way communication in pandemic preparedness by collecting data across disaster phases. Furthermore, they integrated results from the RiskPACC project to propose a co-creative approach for designing solutions that enhance authority–citizen interaction. As an important conclusion to this Research Topic, the article stresses co-creation with diverse stakeholders, trust-building, harmonized narratives, knowledge exchange, and careful use of social media, highlighting the need for interactive, stakeholder-driven strategies as essential for disaster communication in today’s complex risk environment.

The eight articles in this Research Topic provide a unique and crucially needed examination of how we can transcend the boundaries around disaster communication research and practice. Collectively, they highlight several key issues. To improve the effectiveness of disaster communication, we must first recognize and address the existing limitations of current systems and be open to innovative approaches that can integrate new data sources to account for diverse contexts (e.g., hazards, geography, culture, etc.). This could include combining data sources to fill gaps, such as combining traditional risk/impact data with more human-focused narratives, in addition to using social media and crowdsourcing more strategically. It also requires ensuring the accessibility and actionability of data and information, through both technical and non-technical approaches, by tailoring communication to diverse audiences and contexts. Moreover, crossing boundaries to achieve truly impactful and effective disaster communication practices requires a deeper investigation into the mechanisms for learning and collaboration across borders, organizations, and the whole of society, as these mechanisms are essential to strengthening co-creation, trust-building, and knowledge exchange. In truth, this is rarely achieved in practice. However, the studies collected here provide evidence-based examples and recommendations for how to better meet these challenges moving forward.

Author contributions

KB: Writing – original draft, Writing – review & editing. NC: Writing – original draft, Writing – review & editing. RG: Writing – original draft, Writing – review & editing. AN: Writing – original draft, Writing – review & editing. ST: Writing – original draft, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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